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REMARKS

Applicant respectfully request favorable reconsideration and reexamination of this application.

Claims 1, 2, 5, and 14 are amended editorially.

Claims 1-29 are pending in this application.

35 USC 112 Rejection

Claims 1-29 were rejected under 35 USC 112 for being indefinite. Applicants respectfully traverse this rejection. The rejection states that the term "substantial" in claims 1-29 is not defined and the disclosure does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Applicants respectfully disagree.

Claims 1, 2, 5, and 14 include the term "substantial" relating to "interference regions." Claims 1, 2, 5 and 14 are amended and the term "substantial" is deleted from phrases "substantial interference regions" rendering this rejection moot. Applicants are not conceding the correctness of the rejection.

Claims 3, 5, and 14 include the term "substantial center." Applicants submit this readily can be understood in the claims because the term is used as a reference for dividing a light beam separator into two or more regions. The specification also provides clear examples for ascertaining the requisite degree such that one of ordinary skill in the art would have understood the scope of the invention (see, at least for example, Figure 12 and page 27, lines 16-22). Therefore, the term "substantial center" is not indefinite. Applicants respectfully request reconsideration and reexamination of the claims.

Claims 18-24 do not include the term "substantial" but include the term "substantially." The term "substantially" readily can be understood in the context of these claims because the term relate to a portion of a light beam reflected by the light beam reflection portion, other than the light beam focused onto the information recording medium, for example through an objective

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lens. Accordingly, the claim defines the outside of an effective light beam diameter of the lens as one end or edge of the portion of the light beam. Further, one skilled in the art would understand that a useful width or thickness of the light beam is generally definite. Accordingly, with one end or edge of the light beam already defined by the claims, what is "substantially" outside this effective light beam diameter of the lens yet, as disclosed in the specification, still be able to provide a light source for detecting a tilt of the information recording medium, would be understood by one skilled in the art. Therefore, the term "substantially" is not indefinite. Applicants respectfully request reconsideration of the claims.

35 USC 103 Rejections

Claims 1-3, 10, 14, 15, 18, 22, and 25 were rejected under 35 USC 103(a) as being unpatentable over Maeda et al. (US 6,320,699) in view of Komma et al. (US 5,737,296).

Regarding claims 1, 2, 10, 14, 15, 18, and 22, the rejection states that Maeda et al. discloses an arithmetic circuit that corrects a value of the electrical signal detected by the light-receiving element. Applicants respectfully disagree.

Regarding claim 1, Maeda et al. teaches four photosensing surfaces that supply electric signals, in accordance with the intensity of the light, to a signal detecting circuit. The signal detecting circuit generates a focusing error signal and a tracking error signal on the basis of the electric signals supplied from these photosensing surfaces (column 6, lines 45 to 50). Maeda et al. does not teach or suggest correcting the values of the electrical signal detected by the light-receiving element.

In contrast, claim 1 requires an arithmetic circuit that corrects a value of the electrical signal detected by the light-receiving element, in accordance with a radial position signal corresponding to an amount of shift of the objective lens in the radial direction of the information recording medium, and detects the relative angle between the information recording medium and the objective lens or an amount of tilt of the information recording medium with respect to a predetermined reference plane. Komma et al. does not remedy this deficiency.

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Further, the rejection correctly recognizes that Maeda et al. does not disclose the light beam separator element. However, the rejection erroneously states that Komma et al. does disclose a light beam separator element that includes interference regions for light that is reflected from the information recording medium and travels in a straight path and \pm first-order diffracted light produced by information tracks of the information recording medium, and diffracts each of plural light beams in regions of the interference regions. Applicants respectfully disagree that Komma et al. discloses the above light beam separator element.

Komma et al. teaches an optical head device that has a holographic optical element 175 that generates plus and minus first-order diffracted light beams (see Figure 1 and column 7, lines 34-37). In contrast, claim 1 requires that the light beam separator element receives \pm first-order diffracted light that is produced by the information recording medium. The reference's optical head device generates the plus and minus first-order diffracted light beams to obtain a satisfactory level of amplitude to improve the Signal-to-Noise ratio (see column 7, lines 47-56). In contrast, the light beam separator component of the present invention receives the \pm first-order diffracted light that is produced by the information recording medium to detect the relative angle between the information recording medium and the objective lens. Accordingly, the optical element disclosed by Komma et al. is not relevant for what is claimed in claim 1. Therefore, Komma et al. does not provide the teaching for which it is cited in the rejection.

For at least the above reasons, claim 1 should be considered allowable. Claims 2-9 should also be considered allowable for the same reason as their base claim 1. Applicants respectfully request a reexamination and reconsideration of claims 1-9.

Regarding claim 10, the rejection states that Maeda et al. discloses a light beam reflection portion that reflects the light beam from the semiconductor laser and moves together with the objective lens. The rejection relies on Figure 1 of Maeda et al. and reference numerals 3 and 4. Applicants disagree that reference numerals 3 and 4 of Figure 1 of Maeda et al. discloses the light beam reflection portion of claim 10. Even if Figure 1 of Maeda et al. shows an alignment between reference numerals 3 and 4, other elements of Figure 1 clearly shows that reference numeral 3 and 4 do not move together. Figure 1 of Maeda et al. shows that the Driving Circuit

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13 affects the objective lens driving mechanism 15 to drive an objective lens 4 but it does not show any driving of the reference numeral 3 by the Driving Circuit 13. Additionally, Maeda et al. discloses that there are two separate units shown in Figure 1: (1) the objective lens unit and (2) the main unit (see column 5, line 41). Whereas the objective lens 4 is a part of the objective lens unit, the polarizing beam splitter 3 is a part of the main unit. While the components of the objective lens unit include a coil and magnetic circuit for driving just the objective lens, the main unit is fixed to a slider mechanism and moves as a whole unit (column 5, lines 41-64). Therefore, Maeda et al. does not teach or suggest that reference numerals 3 and 4 move together. Komma et al. fails to remedy the deficiencies of Maeda et al. For at least the above reason, claim 10 should be considered allowable. Claims 11-14 should also be considered allowable for at least the same reason as their base claim 10. Applicants respectfully request a reconsideration of claim 10-14.

Regarding claim 15, the rejection states that Maeda et al. discloses an arithmetic circuit that detects the relative angle between the information recording medium and the objective lens. Applicants respectfully disagree. Maeda et al. does not disclose or suggest such an arithmetic circuit. Even if the signal detecting circuit 12 is considered to be an arithmetic circuit, Maeda et al. teaches only that the signal detecting circuit 12 generates a focusing error signal and a tracking error signal. Maeda et al. does not teach or suggest that the signal detecting circuit detects any relative angle or tilt angle between the optical disc and the objective lens. Komma et al. fails to remedy the deficiencies of Maeda et al. For at least the above reason, claim 15 should be considered allowable. Claims 16-17 should also be considered allowable for at least the same reason as their base claim 15. Applicants respectfully request a reconsideration of claim 15-17.

Regarding claims 18 and 22, the rejection states that Maeda et al. discloses an arithmetic unit that calculates the amount of light entering the light-receiving element, and detects the amount of tilt of the information recording medium with respect to a predetermined reference plane. Applicants respectfully disagree. Even if the signal detecting circuit 12 is considered to be an arithmetic circuit, Maeda et al. teaches only that the signal detecting circuit 12 generates a focusing error signal and a tracking error signal. Maeda et al. does not teach or suggest that the signal detecting circuit detects a tilt angle between the optical disc and a predetermined reference

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plane. Moreover, Maeda et al. does not teach or suggest a light-receiving element including at least two light-receiving portions, each of which receives the light beam that is reflected by the light beam reflection portion and then is reflected by the information recording medium, as required by claims 18 and 22. Komma et al. fails to remedy the deficiencies of Maeda et al. For at least the above reason, claims 18 and 22 should be considered allowable. Claims 19-21 should also be considered allowable for at least the same reason as their base claim 18. Claims 23-24 should also be considered allowable for at least the same reason as their base claim 22. Applicants respectfully request a reconsideration of claim 18-24.

Regarding claim 25, the disposition of the rejection states that claim 25 is rejected under 35 USC 103(a) as unpatentable over Maeda et al. in view of Komma et al. However, the rejection lacks a substantive discussion as how Maeda et al. discloses an arithmetic unit that detects a relative position of the information recording medium with respect to a predetermined reference position in the focusing direction and calculates at least the cross-sectional shape of the information recording medium by using a driving signal applied to the objective lens drive by the voltage controller and a focusing error signal produced by the light-receiving element, as required in claim 25. Maeda et al. does not teach or suggest such a unit that can detect information about the height or thickness of the information recording medium. Komma et al. fails to remedy the deficiencies of Maeda et al. For at least the above reason, claim 25 should be considered allowable. Claims 26-29 should also be considered allowable for at least the same reason as their base claim 25. Applicants respectfully request a reconsideration of claim 25-29.

Claims 19 and 20 were rejected under 35 USC 103(a) as being unpatentable over Maeda et al. in view of Komma et al., and further in view of Takekoshi et al. (US 5,602,383). Applicants respectfully traverse this rejection. Takekoshi et al. fails to remedy the aforementioned deficiencies of Maeda et al. and Komma et al. Claims 19 and 20 should be considered allowable for at least the same reason as their base claim 18. Applicants respectfully request a reconsideration of claim 19 and 20.

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In view of the above amendments and remarks, Applicants respectfully request a Notice of Allowance. If the Examiner believes a telephone conference would advance the prosecution of this application, the Examiner is invited to telephone the undersigned attorney-of record, Douglas P. Mueller (Reg. No. 30,300), at (612) 455-3800.



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Respectfully submitted,

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